

## What is claimed is:

[Claim 1] 1. A photographic pointer positioning system comprising a game machine main unit (system main unit), a display screen connected to said game machine main unit (system main unit) for video output, and a photographic pointing device connectable to said game machine main unit (system main unit), said photographic pointing device comprising a control circuit, a communication interface, a camera, at least one reference sign, a computing unit, an image processing circuit, and a set of buttons, wherein:

- said control circuit controls the operation of said camera and receives image signal from said camera;
- said camera is controlled by said control circuit to take the picture of a whole display area of said display screen and to transmit the obtained image signal to said control circuit;
- said at least one reference sign is respectively mounted in said display screen for reference in scan and recognition processing to be done by said image processing circuit to accelerate the processing speed;
- said image processing circuit is controlled by said control circuit to process the image signal received from said camera through scan and recognition processes and to send the processed data back to said control circuit;
- said computing unit is controlled by said control circuit to calculate the coordinate value of the aiming point of said camera at said display screen subject to the data of the image signal obtained from said image processing circuit and to output the calculated coordinate value to said control circuit;
- said communication interface is controlled by said control circuit to transmit the calculated coordinate value of the aiming point of said camera at said display screen to said game machine main unit (system main unit) for further processing;
- said buttons are respectively electrically connected to said control circuit for operation by user.

[Claim 2] 2. The photographic pointer positioning system as claimed in claim 1, wherein said at least one reference sign is respectively formed of an illuminator.

**[Claim 3]** 3. The photographic pointer positioning system as claimed in claim 2, wherein said illuminator is a light emitting diode, bulb or any suitable light emitting materials.

**[Claim 4]** 4. The photographic pointer positioning system as claimed in claim 1, wherein said at least one reference sign is respectively installed in the border area of said display screen around said display area.

**[Claim 5]** 5. The photographic pointer positioning system as claimed in claim 1, wherein said at least one reference sign is respectively installed within said display area of said display screen.

**[Claim 6]** 6. The photographic pointer positioning system as claimed in claim 1, wherein said game machine main unit (system main unit) is a computer system, big game machine, TV game machine or computer terminal system.

**[Claim 7]** 7. The photographic pointer positioning system as claimed in claim 1, wherein said communication interface is connected to said game machine main unit (system main unit) by a signal line for wire communication with said game machine main unit (system main unit).

**[Claim 8]** 8. The photographic pointer positioning system as claimed in claim 1, wherein said communication interface is a wireless communication interface for wireless communication with said game machine main unit (system main unit).

**[Claim 9]** 9. The photographic pointer positioning system as claimed in claim 1, wherein said photographic pointing device provides the functions of an optical mouse, a tablet and a light gun.

**[Claim 10]** 10. A photographic pointer positioning system comprising a game machine main unit (system main unit), a display screen connected to said game machine main unit (system main unit) for video output, and a photographic pointing device connectable to said game machine main unit (system main unit), said photographic pointing device comprising a control circuit, a communication interface, a camera, at least one reference sign, and a set of buttons, wherein:

said control circuit controls the operation of said camera and receives image signal from said camera;  
said camera is controlled by said control circuit to take the picture of a whole display area of said display screen and to transmit the obtained image signal to said control circuit,  
said at least one reference sign is respectively mounted in said display screen for reference in scan and recognition processing to be done by said game machine main unit (system main unit) to accelerate the processing speed;  
said communication interface is controlled by said control circuit to transmit the image signal from said camera to said game machine main unit (system main unit) for further scan and recognition processing;  
said buttons are respectively electrically connected to said control circuit for operation by user;  
said game machine main unit (system main unit) calculates the coordinate value of the aiming point of said camera at said display screen subject to the image signal received from said camera and outputs the calculated data to said display screen for output.

[Claim 11] 11. The photographic pointer positioning system as claimed in claim 10, wherein said at least one reference sign is respectively formed of an illuminator.

[Claim 12] 12. The photographic pointer positioning system as claimed in claim 11, wherein said illuminator is a light emitting diode, bulb or any suitable light emitting materials.

[Claim 13] 13. The photographic pointer positioning system as claimed in claim 10, wherein said at least one reference sign is respectively installed in the border area of said display screen outside the display area of said display screen.

[Claim 14] 14. The photographic pointer positioning system as claimed in claim 10, wherein said at least one reference sign is respectively mounted within the display area of said display screen.

[Claim 15] 15. The photographic pointer positioning system as claimed in claim 10, wherein said game machine main unit (system main unit) is a

computer system, big game machine, TV game machine or computer terminal system.

[Claim 16] 16. The photographic pointer positioning system as claimed in claim 10, wherein said communication interface is connected to said game machine main unit (system main unit) by a signal line for wire communication with said game machine main unit (system main unit).

[Claim 17] 17. The photographic pointer positioning system as claimed in claim 10, wherein said communication interface is a wireless communication interface for wireless communication with said game machine main unit (system main unit).

[Claim 18] 18. The photographic pointer positioning system as claimed in claim 10, wherein said photographic pointing device provides the functions of an optical mouse, a tablet and a light gun.

[Claim 19] 19. A photographic pointer positioning processing process used in the photographic pointer positioning system comprising a game machine main unit (system main unit), a display screen connected to said game machine main unit (system main unit) for video output, and a light gun-like photographic pointing device connectable to said game machine main unit (system main unit), said photographic pointing device comprising sights, a control circuit, a communication interface, a camera, at least one reference sign, a computing unit, an image processing circuit, and a set of buttons including a firing button, said photographic pointer positioning processing process comprising the steps of:

(A) Start;

(B) Aiming the sights of said light gun-like photographic pointing device at a center point of the display area of said display screen and then pressing said firing button;

(C) Driving said camera to take the picture of the whole display area of said display screen and to send the image signal thus obtained back to said control circuit;

(D) Driving said control circuit to send the image signal to said image processing circuit for running scan and recognition processes and then driving

said image processing circuit to send the processed data back to said control circuit;

(E) Comparing the processed data obtained from said image processing circuit to the pixels of said camera to obtain the coordinate values of the four corners of the display area of the display screen in the photographed area;

(F) Calculating the coordinate value of the center point of the display area of said display screen in the photographed area;

(G) Putting the coordinate value of the center point of the display area of said display screen in the photographed area into the coordinate value of the aiming point of said camera;

(H) The aiming point of the sight of said light gun-like photographic pointing device, the center point of the display area and the aiming point of said camera are overlapped;

(I) End.

**[Claim 20]** 20. A photographic pointer positioning processing process used in the photographic pointer positioning system comprising a game machine main unit (system main unit), a display screen connected to said game machine main unit (system main unit) for video output, and a light gun-like photographic pointing device connectable to said game machine main unit (system main unit), said photographic pointing device comprising sights, a control circuit, a communication interface, a camera, at least one reference sign, and a set of buttons including a firing button, said photographic pointer positioning processing process comprising the steps of:

(A) Start;

(B) Aiming the sight of said light gun-like photographic pointing device at a center point of the display area of said display screen and then pressing said firing button;

(C) Driving said camera to take the picture of the whole display area of said display screen and to send the image signal thus obtained back to said control circuit;

(D) Driving said control circuit to send the image signal to said game machine main unit (system main unit) through said communication interface;

- (E) Driving said game machine main unit (system main unit) to run scan and recognition processes subject to the image signal of received from said control circuit;
- (F) Driving said game machine main unit (system main unit) to compare the processed image signal data to the pixels of said camera so as obtain the coordinate values of the four corners of the display area of said display screen in the photographed area;
- (G) Driving said game machine main unit (system main unit) to calculate the coordinate value of the center point of the display area of said display screen in the photographed area;
- (H) Putting the coordinate value of the center point of the display area of said display screen in the photographed area into the coordinate value of the aiming point of said camera;
- (I) The aiming point of the sight of said light gun-like photographic pointing device, the center point of the display area and the aiming point of said camera are overlapped;
- (J) End.